Method of Quantitative Analysis of Nitrogen Contained in Cast Iron. (V)

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		Degree of Decarburization (%)								
		Metrilic Mould			Green Sand Mould			Dry Sand Mould		
		Casting Temperature (Above the Liquidus)								
C %	S %	100°C	50°C	10°C	100°C	50°C	10°C	100°C	50°C	10°C
2.62	1.37	89			71	66	65	83	94	81
2.65	1.74	95		80	885	81	70	90	83.5	80
2.57	1.46	92	90	85		82	86			74

From these results as mentioned above, it is considered that generally the higher the casting temperature, the greater the degree of the carburization, and the degree of the decarburization is greater in the order of the metallic, the dry sand and the green sand mould, respectively.

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57. Method of Quantitative Analysis of Nitrogen Contained in Cast Iron. (V)

Hiroshi Sawamura, Masatoshi Tsuda and *Keiji Omura.*

(Sawamura Laboratory)

In this report, we first studied the extraction percentage of HCl soluble Mn in the cast iron. (this Bulletin **20**, (1950) 52).

Sample; Gray Cast Iron Wt.; 5 grs. (report III).

Apparatus; J. E. S..

HCl solution; 90c.c. of 6N-HCl.

Decomp. Temp.; about 110°C.

Decomposition Duration of Time; 15, 30, 60, 120, 180 min.

Results; Given in Table I.

Table I

Decomp. Time (min)	15	30	60	120	180
Mn (%)	78.38	84.61	100.00	100.00	100.00

Then we determined the nitrogen % in the HCl insoluble residue. For the HCl decomposition, "Gakushin" and H. Kempg's methods were adopted.

We determined the completion of the decomposition by the extraction % of Si, Ti, etc in the residue. As a sample, was taken the decomposition residue treated by 6N HCl solution at about 110°C for 60 minutes.

At the N-analysis in this experiment, filter paper was used instead of asbestos as generally used except in the experiments of the best result.

A) GAKUSHIN method ($HClO_4$–H_2SO_4)

B) H. Kempf's method (K_2SO_4–H_2SO_4–$CuSO_4$)

We recognized the influence of the carbonization of filter paper on the decomposition of the residue, as in Table II.*

Results; Table 2.

Table 2

Decomp. Time (min.)		55	10	15	30	60	120	120*
Decomp. method	$HClO_4$-H_2So_4	1.97	39.47	30.26	40.79	57.89	57.89	89.47*
	K_2SO_4-H_2SO_4 -$CuSO_4$	11.05	19.47	19.47	77.37	53.95	63.16	100.00*

We found that the separation of the HCl insoluble residue by means of asbestos gives a very good result concerning the extraction of Ti contained in the residue in decomposition procedure.

Thus H. Kemph's method is supposed to be better than "Gakushin" method.

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58. Influence of Slag especially of Al_2O_3 and TiO_2 in Slag upon the Structure and Mechanical Properties of Cast Iron. (III)

Hiroshi Sawamura and *Masatoshi Tsuda.*

(Sawamura Laboratory)

In this report, the behavior of combined nitrogen in the gray cast iron is given, when the cast iron is remelted at 1400°C in air atmosphere.

The melting duration of time are 15, 30 and 60 minutes at 1400°C respectively. The sample is removed from the first furnace to the second previously heated at 500°C together with the carbon crucible, after kept at 1400°C for a certain duration of time, and coold to room temperature in the second furnace. The following table shows the results obtained.

Exp. No.	Melting temp. °C.	Melting duration of time min.	N% in HCl soluble solution	N% in HCl insoluble residue	Total N%
original	—	—	0.0033	0.0081	0.0114
D-3-4	1400	15	0.0038	0.0085	0.0123
D-3-5	1400	30	0.0037	0.0110	0.0147
D-3-6	1400	60	0.0038	0.0128	0.0166
D-3-7*	1400	60	0.0037	0.0087	0.0118